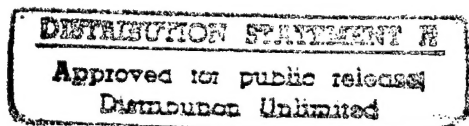# CALS Test Network Information Exchange Users' Manual
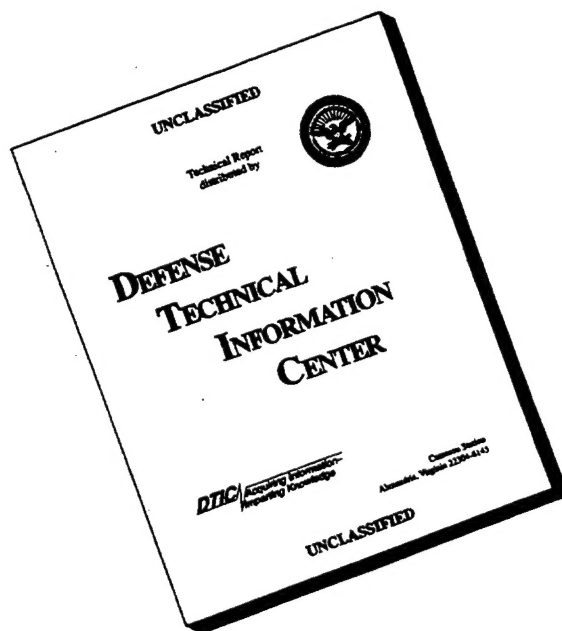
June 12, 1989

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Prepared for
Air Force Logistics Command
AITI Project

Lawrence Livermore National Laboratory

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**CTN Report
89-007**

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CALS Test Network Information Exchange Users' Manual

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CONTENTS

I. INTRODUCTION

The DoD Computer-aided Acquisition and Logistic Support (CALS) Test Network is conducting tests of the military standard for the Automated Interchange of Technical Information (MIL-STD-1840A) and its companion suite of military specifications. The CTN is a DoD-sponsored confederation of voluntary participants from industry and government, managed jointly by a technical staff at Air Force Logistics Command (AFLC) and Lawrence Livermore National Laboratory (LLNL). The objective of CTN tests is to demonstrate and evaluate the interchange and functional use of digital data information between industry and government using the CALS standards.

The CTN Information Exchange (CTN Info-X) is a combination of information services for participants and sponsors of the work of the CALS Test Network. This manual tells how to access and use the CALS Info-X.

II.   LOGGING ONTO THE CTN Info-X

The CTN Info-X runs on a computer located at Livermore, California. The Info-X program is a UNIX "shell" which generates the user menus and which provides access to the various Info-X services. The Info-X may be accessed by direct telephone dial-in or by remote login from terminals on nodes of the Defense Data Network (DDN). Connection to the CTN Info-X is made through a terminal server or "switch".

Terminals and Communications Software

The Info-X Computer supports a wide variety of terminal types, in effect all those terminal types supported by UNIX . These terminals, or computers that emulate these terminals, may be used to access the Info-X. Operation of terminals or terminal emulators is not described here; users should consult their own experts for assistance with their equipment. The more common terminals that are supported by the Info-X computer are listed in Appendix A of this manual.

The Info-X will accept telephone dial-in at 300, 1200 or 2400 baud. The communications program should be set to 8N1 or 7E2 (data bits/parity/stop bits), full duplex. The Info-X dial-in number is supplied to you by letter or telephone.

User names and passwords

User names and startup passwords are assigned by the Info-X System Manager to sponsors of the CTN and to CTN participants. Selection of the menu option, **"USER AIDS"** (See following section, "MENUS"), will display the option, "CHANGE PASSWORD". Select this option to change your password upon first time login to the Info-X and at 12-month intervals.

You will be asked to type in your old password, then your new password two times. Your new password should **not** be composed of your username plus additional characters (e.g., username is msmith, password is msmith88). Neither should your password be a word in the dictionary or a common name of a person.

Passwords should be 6-8 characters long. A good password is made by choosing two words that you can remember easily. Take a syllable from each word and connect them by a number or special character. Be sure that **at least** one non-leading letter is capitalized. Example: the two words are computer and security. The syllables are "comp" and "sec". The password is "comP%sEc". Do not use this password, choose your own!

We ask that you change passwords from time to time, but at least once each year. If you have any questions, please contact User Support via em (username "userhelp") or phone (415) 463-6840.

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Telephone dial-in

The Info-X Systems Manager will give you will the telephone number for direct dial-in. To reach the Info-X, you initiate a two step log-in process. First, you connect to an "annex" or "switch", then to the Info-X computer. If you dial-in over commercial telephone lines, use your terminal or computer to dial the number supplied to you. Connection to the annex is signaled by the following -

```
CONNECT RELIABLE
```

Upon connection, press <RETURN> three or four times at approximately one-second intervals to set the communications speed between your terminal and the terminal server. Your screen now will show -

```
Annex Command Line Interpreter  *  Copyright 1988 etc.

annex: r ati                          enter computer i.d. here
login: [your Info-X ID]               enter your Info-X ID here
Password:[Info-X password]            enter your Info-X password here
         for security reasons the
         password will not print
         on your screen
```

Following successful login, the Info-X computer will ask for your terminal type. If you are using, or emulating, a VT 100, it is necessary only to press the RETURN key as the VT 100 is the default terminal type. If you are using or emulating another terminal type, please enter the code for that terminal type. Please see Appendix A for a listing of codes for common types of terminals. Upon entering the terminal type, the Info-X computer now will display the menu for the CTN Information Exchange (Info-X).

If this is a first-time login, please change your password as described on the previous page.

DDN remote login

If you are using the remote login procedure over DDN, the proper command from your DDN terminal is -

```
rlogin ati.tis.llnl.gov
```

The login procedure is the same as the final steps for telephone dial-in -

```
login: [your Info-X ID]              enter your Info-X ID here
Password: [your Info-X password]     enter your password here
         for security reasons the
         password will not print
         on your screen
```

Following successful login, the Info-X computer will ask for your terminal type. If you are using, or emulating, a VT 100, press the RETURN key as VT 100 is the default. If you are using or emulating another terminal type, please enter the code for that terminal type. Please see Appendix A for a listing of codes for common types of terminals. The Info-X computer now will display the menu for the CTN Information Exchange.

If this is a first-time login, please change your password as described on a previous page.

III. MENUS

The Info-X presents menus of options. Each Info-X menu has two parts: the Menu Title and the List of Options. The Menu Title and Menu of Options change from time to time as information is added, deleted or modified.

Menu Shell

The menus of the Info-X are produced by a program, or shell, that builds the menu from the actual names of directories, files and programs. Each menu title is the actual name of the file directory currently being accessed. Each of the choices in the menu is the actual name of the directory, file or program that is available. The Menu Shell also limits access to those items that are within the legitimate interest of Info-X users.

Main Menu

The Main Menu should appear approximately as shown here -

```
+--------------------------------------------------------------------------+
|  CALS TEST NETWORK INFORMATION EXCHANGE                                   |
|                                                                          |
|  a    BULLETINS                                                          |
|  b    CTN SCHEDULE                                                       |
|  c    CTN STRATEGIC TEST PLAN                                            |
|  d    CTN TEST DATABASE                                                  |
|  e    CTN TEST PLATFORMS                                                 |
|  f    CTN TEST SUMMARIES                                                 |
|  g    ELECTRONIC MAIL                                                    |
|  h    HELP                                                               |
|  i    MAILING LISTS                                                      |
|  j    PARTICIPANTS                                                       |
|  k    USER AIDS                                                          |
|                                                                          |
|                                                                          |
|                                                                          |
|                                                                          |
|                                                                          |
|                                                                          |
|                                                                          |
|                                                                          |
|Enter command. (?/H for Help)_                                            |
+--------------------------------------------------------------------------+
```

NOTE: The content of the Info-X, and the various menus, will change as data files are added or deleted. Information in any one category may or may not be present at login time.

Menu Selections

You may choose from the options listed in the upper left of the MAIN MENU screen. The options from the previously described screen are shown again here. When you select an option by pressing the indicated key, the Info-X will display a new menu, will display an information file or will provide the service indicated.

```
+----------------------------------------------------------
|    CALS TEST NETWORK INFORMATION EXCHANGE
|   a    BULLETINS
|   b    CTN SCHEDULE
|   c    CTN STRATEGIC TEST PLAN
|   d    CTN TEST DATABASE
|   e    CTN TEST PLATFORMS
|   f    CTN TEST SUMMARIES
|   g    ELECTRONIC MAIL
|   h    HELP
|   i    MAILING LISTS
|   j    PARTICIPANTS
|   k    USER AIDS
|
|
```

Help

Either the capital H or the question mark will display a screen of commands that may be used to work with text files such as bulletins or mailing lists. These are similar to, but different than, commands used with the UNIX editor, 'vi'.

```
+--------------------------------------------------------------------------+
| general                                                                  |
|                           Command Summary                                |
| Command          Action                                                  |
|                                                                          |
| ^D               Leave menu, must be entered twice                       |
| 1-9              Select page 1-9                                         |
| 0                Select page 10                                          |
| +, ^F            Select next page, + next column                         |
| -, ^U            Select previous page, - previous column                 |
| ^L               Re-display same page                                    |
| a-t              Select associated item                                  |
| ^,/ (HOME)       Change to Home Menu                                     |
| \                Change to previous menu (undo last change menu)         |
| ?                Display this page                                        |
| line feed        Change to parent menu.                                  |
| D                Date                                                     |
| Done:                                                                    |
|                                                                          |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+
```

NOTE: The content of the Info-X, and the various menus, will change as data files are added or deleted. Information in any one category may or may not be present at login time.

IV.   Info-X OPTIONS

At this time the following are the principal information categories on the Info-X. However, see note, below.

BULLETINS   A selection of bulletins related to CALS or the CTN. Some of these bulletins may duplicate bulletins found on the NIST CALS Bulletin Board.

CTN PARTICIPANTS   Information on CTN Participants including electronic mail addresses, summary of CTN Application and Test Plans.

CTN SCHEDULE   A a schedule of CTN tests.

CTN TEST DATABASE   Data tables of analytic data for completed CTN tests.

CTN TEST PLANS   Details of CTN tests, planned or in progress.

CTN TEST PLATFORMS   Descriptions of CTN Test Platforms.

CTN TEST SUMMARIES   Executive Summaries of published AITI Reports, and, in some cases, draft summaries of reports not yet published.

ELECTRONIC MAIL   Complete electronic mail capability on a DDN node.

HELP   An abbreviated help summary. See previous page.

USER AIDS   Various user aids, including password changing.

NOTE: The content of the Info-X, and the various menus, will change as data files are added or deleted. Information in any one category may or may not be present at login time.

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V.   ELECTRONIC MAIL

Starting Electronic Mail (EM)

Selection of the menu option, **'ELECTRONIC MAIL'**, gives access to a complete electronic mail system, with access to nodes on the Defense Data Network (DDN). The user i.d. for electronic mail is the same as that used to log onto the Info-X. The introductory screen for electronic mail will be similar to the following:

```
+----------------------------------------------------------------------+
|                                                                      |
|Valid shells are:                                                     |
|        /bin/csh                                                      |
|        /bin/sh                                                       |
|        /bin/ksh                                                      |
|                                                                      |
|Option shell not changed                                             |
|Electronic Mail: Version 8.1.5                                       |
|                                                                      |
|Type 'help' for help.                                                |
|                                                                      |
|                                                                      |
|To turn off the introductory help message, set the option "expert" to true. |
|--------------------------------------------------------------------- |
| (a)nswer    (con)fer   (g)roup   (li)st     (pi)pe    (sel)ect   (w)ho |
| (b)ack      (d)elete   (hea)der  (m)ail     (pu)ll    (sen)tmail    ! |
| (ch)eck     (ed)it     (hel)p    (n)ewmail  (q)uit    (set)        ? |
| (cl)ose     e(x)it     (i)ndex   (op)en     (r)ead    (so)rt        |
| (com)pose   (f)orward  (la)st    (or)der    (sa)ve    (u)ndelete    |
|--------------------------------------------------------------------- |
|At the EM prompt, type 'help' to re-display this and other help information. |
|                                                                      |
|You have 0 messages.                                                 |
|                                                                      |
|EM+                                                                   |
+----------------------------------------------------------------------+
```

Please note that the '**(pi)pe**' and '**!**' commands, shown here, are not available on the Info-X. Appendix B gives a summary of the commands available to the EM user on the Info-X. With experience the Info-X user will be able to create, answer, forward, store, sort and retrieve messages. Instructions are given here for simple creation, transmission, reading and storage of a message.

Sentmail

The electronic mail system allows you to create a **'sentmail'** file in which to automatically store copies of all of the messages that you send. If you want this feature, enter the sentmail command once to create this file

```
|
| EM+   sen
|
```

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Sending EM

To send an EM message, enter 'm' to begin a message and enter data in response to the prompts -

```
EM+ m <return>
to: maryuser othruser@lognet1.arpa
cc: prassino garner farrell howe lammers@lognet1.arpa
subject: Test Transmission

Type message, end with CARRIAGE-RETURN followed by CTRL-D:

Hello Mary

This is my first message on the Info-X electronic mail.  Please
let me know that you have received it.

John User
```

You complete the message by entering 'CTRL-D' on a blank line at the end of your message. The mail system will display a set of options; enter 'r' for receipt requested.

```
abort, display, help, include, message, modify, receipt,
save, send, spell, userinfo, whoto: r
```

The mail system again will display the set of options; this time enter 'se' for send.

```
abort, display, help, include, message, modify, receipt,
save, send, spell, userinfo, whoto: se
```

A copy of your message will be stored in your 'sentmail' file on the Info-X, provided you have created a sentmail file, as noted above.

Receiving EM

When you enter the electronic mail system, you will be informed if there are any messages:

```
|
|You have 12 messages.
|
```

To read a message, enter (r)ead and the message number at the EM prompt. 'r' alone will read the next unread message. For a long message, enter ' **r|more** to display your massage one screen at a time. Advance the display with **<space>** or **<RETURN>**.

```
+------------------------------------------------------------
|
|EM+   r 1
|
|Message 1
|
|SUBJECT : Test Transmission
|SENT BY : johnuser
|DATE    : 14 Dec 1988 at 1052 PST
|SENT TO : maryuser nothrusr@lognet1.arpa
|COPY TO : prassino garner farrell lammers@lognet1.arpa
|ORIG BY : johnuser (John User)
|STATUS  : New, read
|
|Hello -
|
|This is my first message on the Info-X electronic mail.
|Please let me know that you have received it.
|
|John User
|
|
|EM+
|
```

Storing messages

In addition to the sentmail file mentioned above, you may create additional files for storage of messages by category. To save the above message to a special file, for example, 'testmsgs', enter:

```
|
|EM+ sa 1 testmsgs
|
```

If this is a new file, the Info-X will ask that you confirm creation of the file. To access the testmsgs file, enter the open file command:

```
|
|M+ op testmsgs
|
```

The system will respond:

```
|
|..... You have 22 messages.
|
|EM+
|
```

Please note that there will be a time limit on the life of your files. After a period, probably 6 months, your old mail files will be removed from disk without notice to you. If you have long term need for messages, either sent or received, please copy your messages to your home system.

Uploading and Downloading Text

For the present, uploading of massages is available only through reading (sending) an ASCII file to the Info-X while you a writing a message. Both uploaded text and keyboard generated text may be entered into one message. Similarly, downloading of messages is available only through whatever logging function is available on your local system.

Redirection of Received EM Messages to Another EM Address

If you have an account on a DDN node or on a system that can be accessed via a DDN node, you may ask the Info-X user help to redirect all received messages to your home electronic mail address.

Editing Messages

The UNIX editor, 'vi', is used by the electronic mail system to edit messages. (Please see Appendix C, Visual Editor (vi) Quick Summary, for a brief exposition of the available vi commands.) Upon completion of data entry for a message, and upon display of the options prompt, enter the (m)odify command. In response to the next message, asking what is to be modified, enter (m)essage:

```
abort, display, help, include, justify, message, modify, receipt,
save, send, spell, userinfo, whoto: mo
tag, to, cc, bcc, receipt, reply-to, subject,message, help, or helpedit: m
```

At this point, the 23 lines of your message will be displayed. Experimentation with the vi command set will bring you up to speed. A few basic instructions follow.

Moving around in vi.

Use the lower case **h, j, k and l** keys to move around in the displayed text:

h	move **left** one character.
j	move **down** one line.
k	move **up** one line.
l	move **right** one character.

On some terminals, the left arrow, up down arrow, up arrow and left arrow perform the same function. Additional commands for moving to **top or middle of screen,** moving to **beginning or end of line, making corrections** and **copying or relocating blocks of text.**

Entering text.

As vi uses the same keys for commands and for entering text, it is important to understand how text entry is initiated and how it is stopped.

a	initiate text entry **after** the cursor position.
i	initiate text entry **before** the cursor position.
o	initiate text entry **on a new line below** the cursor position.
O	initiate text entry **on a new line above** the cursor position.
esc	end text entry and return vi to the command mode.

Ending editing.

Use one of the following commands to save work and/or exit vi.

:w	Save work and continue editing.
:wq	Save work and exit vi.
:q!	Do not save work and exit vi.

VI.   MAILING LIST

Selection of the menu option, **'MAILING LIST'**, will display a a sub-menu with two choices:

```
|
| a    Mailing List by Organization
| b    Mailing List by Name
|
```

Each of these options gives a two column display of names, addresses and telephone or fax numbers, or electronic mail addresses, as shown here.

```
+-----------------------------------------------------------------+
|Albright, Don                    Albright, Gallard                |
|INDUSTRY                         INDUSTRY                          |
|3M                               Beech Aircraft                   |
|235-1D-05 3M Center              P.O.Box 85  MS 90-E10            |
|St Paul, MN 55144                9709 East Central                |
|                                 Wichita KS 67201                 |
|                                                                  |
|Allison, Cliff                   Amaral, Chuck                    |
|INDUSTRY                         INDUSTRY                          |
|IBM                              Rockwell International           |
|1301 Pickard Drive               Space Transportation Sys Div     |
|Rockville, MD 20850              Mail Code D/379 841-BA36         |
|                                 12214 Lakewood Blvd              |
|                                 Downey, CA 90241                 |
|                                 213/922-4143                     |
|                                                                  |
|Anderson, Dr. B. D.              Anderson, John                   |
|INDUSTRY                         INDUSTRY                          |
|General Dynamics                 Boeing Commercial Airplane       |
|Data Systems Division            Test Report                      |
|Test Report                      MS 03-55 P.O.Box 3707            |
|P.O. Box 748                     3003 West Casino Road            |
|Fort Worth, TX 76101             Everett, WA 98124-2207           |
|More ('H' for help)?                                              |
+-----------------------------------------------------------------+
```

Enter 'H' to display a summary of commands for moving about in the Mailing List.

Further exploration of these menu options will lead to summaries of capabilities and interests of each participant and, where available, detailed plans for the CTN tests in which they will take part.

APPENDIX A - Terminal Type Codes for Commonly Encountered Terminal Types

ansi	Any ANSI terminal with pessimistic assumptions
apollo	Apollo
cdc456	CDC
cdc721	CDC 721
cdc721	CDC 721-na
gt40	Dec gt40
gt42	Dec gt42
vt100	Dec vt100
vt125	Dec vt125
vt200	Dec vt200
vt50	Dec vt50
vt50h	Dec vt50h
vt52	Dec vt52
1620	Diablo 1620
fos	Fortune system
hp	Hewlett-Packard
hp150	Hewlett-Packard 150 - personal computer
ibm	IBM3101
kaypro	Kaypro
versaterm	Macintosh running versaterm
912b	New Televideo 912
920b	New Televideo 920
os	Osborne Exec
fox	Perkin Elmer 1100
owl	Perkin Elmer 1200
pe550	Perkin Elmer 550
pty	Psuedo teletype
q102	Qume 102
qume5	Qume Sprint 5
trs100	Radio Shack TRS-80 Model 100 Portable
sun	Sun Microsystems Workstation console
tab132	TAB132/15
4105o	Tektronix 4105o
4025	Tektronix 4/4025/4027
tek4015	Tektronix 4015
tek4023	Tektronix 4023
tek4105	Tektronix 4105
tvi950	Televideo950
tvi955	Televideo955
vt132	vt132
x1720	Xerox 1720
z100	Zenith Z100 running compaq software
h29	Zenith-29

APPENDIX B - ELECTRONIC MAIL (EM) QUICK REFERENCE

This page summarizes EM commands. Enter each command at the EM prompt, EM+. For full details on a command, use HELP. Parentheses indicate the shortest acceptable abbreviation for the command. Available abbreviations for messages are: ., current; +, next; -,previous; $, last; *,all(1-$).

Entering/Exiting EM

em	Start up EM. (May also be a menu option)
(q)uit	Quit EM; save changes ·
e(x)it	Exit EM; don't save changes

Creating & Sending Mail

(sen)tmail	Create sentmail file to keep copies of outgoing messages (do once).
(m)ail	Create or mail a message.
	EM+M　　omit message field
	EM+m　　don't omit message field
	To: garner,lammers@lognet1.arpa
	Cc: prassino
	Subject: CTN Test 89-002
	(message): Type message, end message with
	<cr> <ctrl-d>
	(edit prompt): Type 'se' to send message
(com)pose	Create message without sending it.
(ed)it	Edit message

Handling Incoming & Existing Mail

(i)ndex	List messages in current mail file.
	EM+i　　**EM+i 1,3,5-9**
(r)ead	Read message
	EM+r 3　**with EM formatting**
	EM+R 3　**without EM formatting**
(a)nswer	Answer message
	EM+a 3　**don't include message body**
	EM+A 3　**include message body**
(f)orward	Forward message.
	EM+f 4　**with comment**
	EM+F 4　**without comment**
(d)elete	Delete message.
	EM+d 2
(u)ndelete	Undelete message.
	EM+u 2
(sa)ve	Save message to another file.
	EM+sa 2　delete from current file
	EM+SA 2　don't delete from current file
	EM+sa 3 memos

Handling Incoming & Existing Mail

(hel)p	Help for EM commands & options.
	EM+help　　　**EM+help exit**
(w)ho	Identify user and mailgroup names.
	EM+wp　　　**EM+w lammers**
(g)roup	Identify groups, group members
	EM+g　　　　**EM+g training**
(la)st	Check when users last read mail.
	EM+la garner,prassino
?	Display mail file status.

Listing & Changing Mail Files

(li)st	List mail files.
(op)en	Switch to mail file indicated.
	EM+op　　　list open mail files
	EM+op memos　Switch to file
(cl)ose	Close mail file and add changes.
	EM+cl memos　Switch to file
(n)ewmail	Switch to incoming mail file; add new messages.
(b)ack	Return to previous open mail file.

Reordering & Selecting Messages

(or)der	Reverse message order.
(so)rt	Sort messages by field.
	EM+so from
(sel)ect	Create a selection of messages.
(pu)ll	Pull messages by field to temp. file.

Miscellaneous

(con)fer	Create a new conference.
(ch)eck	Check syntax of special mail files.
(hea)der	Add mail header to EM.
set	Display or set mail options.

APPENDIX C - ELECTRONIC MAIL (EM) COMMAND SUMMARY

Command	Function	Syntax
?	Display mail file status.	?
answer	Answer message: include message body (A), don't (a).	a | A [*msgs* | *users*]
back	Return to previous open mail file.	b
check	Check syntax of automatic forwarding and logging files.	ch *file* [*msgs*]
close	Close an open mail file and make its changes permanent.	cl [*mailfile*]
compose	Create a message field only ans save unsent.	com
confer	Create a conference.	con
delete	Delete message (quit or switching files makes permanent).	d [*msgs* | *mailfiles*]
edit	Edit messages.	ed [*msgs*]
exit	Exit EM; work not saved.	x
forward	Forward message: comment (f), none (F).	f | F [*msgs*] [*users*]
group	Identify mail groups and members.	g [*groupnames*]
header	Add new header fields to EM.	hea *fields*
help	On-line help.	hel *entry*
index	List (index) messages.	i [*msgs*]
last	Check when user last read mail.	la *users*
list	List mail files and conferences.	li [*m* | *c*]
mail	Mail a message: message field (m), none (M).	m | M [*msgs* | *users*]
newmail	Switch to incoming mail file; add new messages to index.	n
open	Switch to new mail file or show all open mail files.	op [*mailfile*]
order	Reverse message order.	or
pull	Pull messages by data in field to temporary file.	pu [*cmd*] [*data*]
quit	Quit EM; save work.	q
read	Read message / conference summary.	r | R [*msgs* | *conf*]
save	Save message in specified file: delete from old (sa), don't (SA).	sa | SA [*msgs*[*mailfile*]]
select	Create a selection (one or more messages.	sel[*msgs*|pull[*field*[*data*]]]
sentmail	Create file to record all mail you send (do once).	sen
set	Display or set mail options.	set [*option* [= *value*]]
sort	Sort messages by field.	so [*field*]
undelete	Undelete message.	u [*msgs*]
who	Identify user and mailgroup names.	w [*pattern*]

Conventions: bold, command; *italics*, types replaced by actuals; [ ], optional; |, alternatives; cmd, any EM command; conf, any conference; data, aspecified portion of a header field; entry, a help topic, command or option; field, any header field such as to or cc; mailfile, any mail file name; msgs, a single message number (1), a series (3,5,7), a range (10-15), or any combination; pattern, any portion of user or mail-group name; users, user name(s), mail group(s), or DDN Internet address(es), separated by commas.

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APPENDIX D - VISUAL EDITOR (vi) QUICK REFERENCE

The UNIX Visual Editor, 'vi', is used within electronic mail to modify messages. It is accessed through the edit and the modify commands. This page summarizes only the *most commonly used* vi commands. Use it after reading an explanation of vi, available in most texts on UNIX. a vi command with an asterisk after its explanation can be prefaced with a number to expand the action. Typing a colon (:) allows you to use **ex** commands in **vi**. A few are included below.

Entering/Exiting vi

ed [*msg*]	Start up **vi**.
mo	Start up **vi**.
:w	Save work and no exit
:wq	Save work and exit **vi**
:q!	Do not save work and exit vi.

Cursor and Screen Movement

h	Move left on current line
j	Move down from current line
k	Move up from current line
l	Move right on current line
^ or 0	Move to beginning of line
$	Move to end of line
w	Advance one word*
b	move backwards, one word*
H	Move to top line of screen*
M	Move to middle of screen
G	Move to end of file*
1G	Move to line 1 of file
	(Any line may be specified)
<cr>	Advance to next line
z <cr>	Make current line top line
CTRL-B	Move backward 1 full screen
CTRL-F	Move forward 1 full screen
CTRL-U	Scroll up 1 half screen
CTRL-D	Scroll down 1 half screen
/*pattern*	Look forward for pattern
?*pattern*	Look backward for pattern
n	Find next occurance of pattern
CTRL-G	Line status information
CTRL-Z	Suspend vi; **fg** ends

Text Entering Commands[1]

(Press ESC to end)

a	Add text to right of cursor
i	Add text to left of cursor
o	Open a new line BELOW to add text
O	Open a new line ABOVE to add text

Making Corrections[2]

x	Delete single character
dw	Delete a word*
dd	Delete a line*
D	Delete a line (from cursor to end of line)
r	Replace a character (with next typed)
~	Change a letter's case
J	Joine two lines (use at end of first line)
u	Undo last change made on line
U	Restore line (original state before changes)

Replacing a Word or Line[1]

(Press ESC to end)

cw	Change a word*
C	Change a line (from cursor to end of line)

Relocation Commands

yy	Yank copy, place in buffer*
P	Put buffer ABOVE line*
p	Put buffer BELOW line*
:*1,26co82*	Copy lines after line
:*1,26m82*	Move lines after line
:*1,26wfilename*	Write lines to new file
:s/*old/new*/g	Global search and replace

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1   Until you press ESC all commands are treated as characters rather than as commands.

2   The last contents yanked or deleted can be restored by using the **p** command.

*   May be prefaced with a number to expand the action; see introductory paragraph.